

THE ROLE OF PLANT AGRICULTURAL PRACTICES ON DEVELOPMENT OF ANTIMICROBIAL
RESISTANT FUNGI AFFECTING HUMAN HEALTH

Tuesday, June 21 2022
10:00 AM – 2:00 PM ET
Virtual

Bridging the Two Worlds: Fungal Pathogens in Plant and Human Health

XX AM **Welcome Remarks, Workshop Overview & Goals**

- Define scope: Plant agriculture as the primary area of concern with fungicides, less of a concern in animals (perhaps providing magnitude of uses for context)

XX AM **Opening Panel** *(what does the current use landscape look like, have different sides speak to each other and share their questions and concerns)*

- Panelist/Speaker 1: fungicide uses in plant agriculture
 - Include history of fungicide development
- Panelist/Speaker 2: antifungal use in human medicine
 - Include history or overview of fungal diseases of concern in modern medicine
- Panelist/Speaker 3: non-plant uses of fungicides
 - Industrial use of triazoles
- Panel discussion to cover:
 - Overview of the issue of fungicide and antifungal resistance
 - Define current fungicide use and overlap with the antifungal arsenal
 - Questions and concerns from each side regarding use and pathogen resistance, human health and safety, economic considerations

Commented [LJ1]: Might be more suitable as a panel (each person gives a short presentation, then have panel discussion together at the end) to frame the opportunity for dialogue

15 min break?

XX AM **Antifungal Resistance and Human Health** *(why do we need it in human health)*

- Types and burden of fungal diseases, current treatment options, outcome from treatment and impact of antifungal resistance: David Denning (GAFFI, ret. Univ. of Manchester)?
- Maybe have a presentation focused on estimated economic impact?
- Mechanisms of resistance in fungal pathogens causing human

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diseases

- XX AM **Fungicide Resistance and Plant Health** (*why do we need it in plant agriculture*)
- Plant diseases and importance of fungicide use (disease burden, treatment, outcomes of fungicide use and challenge of AMR)
 - Genetics and mechanisms of fungicide resistance
 - Current evidence base associating environmental fungi and antifungal resistance (triazoles and others)
 - Practices that influence AMR in plant use environments
- XX AM **Roundtable Discussion** (with speakers from the previous two blocks?)
- XX **Summary, Adjourn**
- Highlight connections between human, plant, and environmental health in fungal AMR

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Wednesday, June 22 2022
10:00 AM – 2:00 PM ET
Virtual

Effects of Fungicide Use in Plants on Humans and the Environment

XX AM **Welcome Remarks, Review of Day 1**

XX AM **Role of Fungicides in Plant Disease Management** (*why we need fungicide use in plant health: implications for human health outside issue of resistant fungal pathogens*)

- Management of fungal diseases in plants: overview that shows fungicide as part of a multitude of different tools and approaches, specify the role that fungicides play within this bigger picture: Someone from APS or Gilberto Olaya (NAFRAC)?
 - Important to speak on integrated disease management
- Food safety and food security
 - Crop production needs for global food security
 - Economics of fungicide use in different crops and yield: Kiersten Wise or Daren Mueller?
 - Fungicide application for “plant health”
 - Example of mycotoxin contamination: Pierce Paul (use of triazoles to manage Fusarium head blight in wheat)
- Global fungicide regulations and use management
 - US focus:
 - Registration review process of antifungals, suggest someone from the EPA if US focus
 - Socioeconomic impacts (including stewardship efforts), suggested speaker Carl Bradley, APS Liaison to EPA, also touch on IPM practices particularly for triazole fungicides
 - International focus
 - Examples from regulatory side and scientific communities

15 min break?

XX AM **State of Global Plant and Environment Surveillance** (*what is being used where and how much, where are we seeing resistance in the environment, what do these mean in the context of plant use and development of resistant pathogens for*

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human disease?)

- Surveillance of fungicides in plant use
 - High-Income Countries
 - Low- and Middle-Income Countries
 - Suggested speaker: Phil Taylor
- Environmental surveillance and management
 - FRAME Network as example of work on developing tools to address resistance, IPM strategies in the US Pacific Northwest: Walt Mahaffee
 - Compost Council, horticulture/flower (e.g., bulbs, flower farms in WA and OR) industry practices and surveillance?
 - what are the processes, spore spread at different stages of production, how to minimize spore spread
 - Sampling strategies, interpretation of sampling outcomes: [[HYPERLINK](https://scholar.google.com/citations?hl=en&user=8dMWriAAA&view_op=list_works&sortby=pubdate) "https://scholar.google.com/citations?hl=en&user=8dMWriAAA&view_op=list_works&sortby=pubdate"] (Univ. Florida) for data network and analysis? Larry Madden (Ohio State Univ) may also have suggestions
 - Water sampling for triazoles or resistant fungi (is anyone doing this work)?
 - A One Health approach to current AMR surveillance and mitigation measures: Paul Verweij (Radboud University)
- Other suggested participants:
 - Ana (?) at CDC for global resistance and clones

Commented [LJ2]: This might belong better in Day 3?

Commented [LJ3]: May be important to include consideration of data integration for distinct data streams and future-proofing for a true One Health approach as available data expands (e.g., tying into Day 3 if we want to bridge with the animal/antibiotics AMR world)

XX PM **Discussion**

XX **Summary, Adjourn**

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Monday, June 27 2022

xx – xx ET

Hybrid

Mitigation Strategies for Fungicide/Antifungal Resistance

- XX AM **Welcome to in-person participants**
- XX AM **In-person event (Poster Session, Networking, Breakfast, etc)**
- XX AM **Welcome virtual attendees; Review of workshop thus far**
- XX **Other Fungal Pathogens Important for Human Health** *(are there potential implications for other emerging fungal pathogens?)*
- Matthew Fisher (Imperial College London)?
- XX **Innovations in AMR surveillance**
- Addressing knowledge and policy gaps
 - Innovation in data collection/technology/tools for surveillance
- XX **Innovations in AMR mitigation and policy**
- Innovation in data collection/technology/tools/policy for mitigation
 - Industry perspective on AMR management
 - Andreas Goertz (FRAC)?
 - Alternative approaches: Integrative Disease Management
 - Suggested participant: Kerik Cox (Cornell Univ.)
 - Suggested participant: Guido Schnabel (Clemson Univ.)
- XX **Breakout session**
- Priority action items for:
 - Technology and Tools
 - Policy
 - Mitigation
 - Surveillance
 - Research Gaps
- XX **Discussion**

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XX Summary of Workshop, Adjourn